

REMARKS

I. Status of the Application

Claims 12-23 are all the claims currently pending in the application. Claims 12-23 have been rejected. The present Response addresses each point of rejection raised by the Examiner. Favorable reconsideration is respectfully requested.

II. Claim Rejections Under 35 U.S.C. § 103(a)

Claims 12-23 stand rejected under 35 U.S.C. § 103(a) as allegedly being obvious over U.S. Publication No. 2002/0153361 to Sakamoto et al. (hereinafter “Sakamoto”) in view of U.S. Publication No. 2003/0160034 to Filgas et al. (hereinafter “Filgas”). Applicants respectfully traverse this ground of rejection.

Preliminarily, Applicants again note that the Examiner has failed to establish a *prima facie* case of obviousness for *at least* dependent claims 13-17 and 19-23. An applicant is entitled to a patent unless the Examiner provides a reasonable basis explaining why the claimed invention is not patentable. The initial burden is on the Examiner to present a *prima facie* case of obviousness, and the analysis supporting a rejection under 35 U.S.C. § 103 should be made explicit. MPEP § 2142. As discussed in MPEP § 706.02(j), the Examiner should provide the following analysis for a rejection under 35 U.S.C. § 103:

- (A) the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate,
- (B) the difference or differences in the claim over the applied reference(s),
- (C) the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and
- (D) an explanation as to why the claimed invention would have been obvious to one of ordinary skill in the art at the time the invention was made.

However, in rejecting the claims, the Examiner only addresses some of the elements recited in independent claims 12 and 18. The Examiner does not explain where any of the references disclose the elements recited in claims 13-17 and 19-23, or why modifying the references to include any missing elements would have been obvious to a person of ordinary skill in the art. For example, the Examiner does not identify where the references teach or suggest a sensor for measuring energy of the laser beams, as recited in claim 13. Further, the Examiner does not explain the analysis performed according to steps (A)-(D) above. Therefore, the Examiner has not established a *prima facie* case of unpatentability for claims 13-17 and 19-23.

Independent Claim 12

Independent claim 12 recites a laser machining apparatus comprising “a third polarizing beam splitter, capable of polarizing-angle adjustment, disposed in front of the first polarizing beam splitter.” In rejecting claim 12, the Examiner concedes that Sakamoto fails to disclose “three polarizers” (Office Action, page 3). However, the Examiner maintains that Filgas discloses “multiple polarizers,” and that it would have been obvious to incorporate an additional polarizing beam splitter into the apparatus of Sakamoto, because this would be an addition of multiples, and duplication of parts has been held to be obvious. Applicants respectfully disagree.

Applicants submit that disposing a third polarizing beam splitter in front of the first polarizing beam splitter of Sakamoto would not have been a mere duplication of parts. Instead, such an addition would fundamentally change the operation of the laser machining device of Sakamoto. As a person of ordinary skill in the art understands, this third polarizing beam splitter would split the incident circularly polarized light beam 27 (shown in Fig. 8 of Sakamoto) into two beams having different polarizations (*see* ¶ [0114]). At least some of the light would not reach the spectral polarizing beam splitter 28 of Sakamoto, because it would be reflected in a

different direction by the third polarizing beam splitter. Therefore, inserting the third polarizing beam splitter would change the amount and polarization of the light incident on the spectral polarizing beam splitter 28 of Sakamoto, thereby changing the character of the light propagating through the entire laser machining device.

In addition, an object of Sakamoto is to provide a laser machining device that prevents increases in cost and size while improving productivity in precise machining (§ [0020]). Sakamoto notes that in related art devices, adding an additional galvanometer scanner and an additional F θ lens causes a problem of increasing the cost of the laser machining device (§ [0018]). Therefore, Applicants submit that a person of ordinary skill in the art would not have been motivated to modify the laser machining device of Sakamoto to insert a third polarizing beam splitter in front of the spectral polarizing beam splitter 28, because this addition would have increased the cost of the laser machining device. Such a modification would have been contrary to the purpose of Sakamoto. Further, Sakamoto does not recognize any improvements in productivity that could have been achieved by adding the third polarizing beam splitter.

Applicants submit that claim 12 is patentable over Sakamoto at least by virtue of the aforementioned differences, as well as its additionally recited features. Further, Filgas fails to remedy the deficient teachings of Sakamoto. Therefore, claim 12 is patentable over Sakamoto and Filgas at least by virtue of the aforementioned differences, as well as its additionally recited features. Further, claims 13-17 are patentable over Sakamoto and Filgas at least by virtue of their dependencies on claim 12, as well as their additionally recited features.

Independent Claim 18

Independent claim 18 recites a laser machining apparatus in which “focal positions of the two laser beams are measured, based on a measuring means for measuring the focal positions of

the laser beams, and adjustment is carried out by a deformable mirror so that the difference between the focal positions of the two laser beams is below a desired reference.” In rejecting claim 18, the Examiner concedes that Sakamoto fails to disclose a deformable mirror (Office Action, page 3). However, the Examiner maintains that Filgas discloses “a fold (deformable) mirror,” and that it would have been obvious to incorporate a deformable mirror into the apparatus of Sakamoto, because this would allow for more maneuverability (Office Action, page 4). Applicants respectfully disagree.

As discussed in the Response dated June 25, 2008, a deformable mirror is a mirror that can change its shape (see, e.g., page 21, third full paragraph of present specification¹). In contrast, the fold mirrors 416 of Filgas are merely planar mirrors that do not change their shape. In response to this argument, the Examiner states that a “foldable mirror is a deformable mirror,” and concludes that the claim limitation is met by the fold mirrors 416 of Filgas. Applicants respectfully disagree. Initially, Applicants note that the mirrors 416 of Filgas are fold mirrors, not foldable mirrors. Further, as a person of ordinary skill in the art understands, a “fold” is a “change in the direction of a system's optical axis caused by a reflective component.”² Accordingly, as shown in Fig. 4G of Filgas, each fold mirror 416 merely changes the propagation direction of the incident light by reflecting the light (¶ [0092]). The fold mirrors 416 of Filgas are not deformable mirrors that can change their shape.

¹ Also see Glossary, Canada and the Thirty Meter Telescope, available at <http://lot.astro.utoronto.ca/glossary.html>.

² Photonics Dictionary, available at <http://www.photonics.com/directory//dictionary/lookup.asp?url=lookup&entrynum=2041&letter=f>.

Further, as discussed in the Response dated June 25, 2008, neither Sakamoto nor Filgas discloses “a measuring means for measuring the focal positions of the laser beams.” In response, the Examiner asserts that “the distance between the lens and the object and the focal distance/position is disclosed by Sakamoto” (Office Action, page 5). Applicants respectfully disagree. Assuming *arguendo* that Sakamoto discloses the focal positions of the laser beams 27a and 27b, this does not imply that Sakamoto measures the focal positions. Fig. 3 of Sakamoto is a schematic diagram illustrating the positional relationships of optical components within the laser machining device shown in Fig. 8 (¶¶ [0078] and [0116]). These positional relationships are determined by equations (1)-(3), and prevent the laser beam from getting out of the main deflecting galvanometer mirrors 7 (¶¶ [0007]-[0012] and [0079]). Because the positional relationships are calculated according to equations (1)-(3), Sakamoto does not need to measure the focal positions of the laser beams, as recited in claim 18. Further, Filgas fails to remedy the deficient teachings of Sakamoto.

Applicants submit that claim 18 is patentable over Sakamoto and Filgas at least by virtue of the aforementioned differences, as well as its additionally recited features. Further, claims 19-23 are patentable over Sakamoto and Filgas at least by virtue of their dependencies on claim 18, as well as their additionally recited features.

III. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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Date: June 9, 2009

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